LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA12 | Waddesdon and Quainton

Baseline (SV-002-012)

Sound, noise and vibration

November 2013

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Department for Transport

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1 Introduction

1.1 Structure of the sound, noise and vibration appendices

1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these is an introduction to the relevant policy and methodology (Volume 5: Appendix SV-001-000). This relates to the sound, noise and vibration assessment for all community forum areas (CFA).

1.1.2 For the Waddesdon and Quainton area, the other three sections are as follows:

- baseline sound, noise and vibration (Volume 5: Appendix SV-002-012) (this appendix);
- construction sound, noise and vibration (Volume 5: Appendix SV-003-012); and
- operational sound, noise and vibration (Volume 5: Appendix SV-004-012).

1.1.3 Maps referred to within this appendix are contained in the Volume 5, Sound, Noise and Vibration Map Book.

1.1.4 This appendix includes details of the existing and future baseline sound environment within the area. It provides details of measurements and any other data collection which has been undertaken in order to obtain existing and future baseline sound levels.

1.2 Existing acoustic environment

1.2.1 The existing baseline sound environment for this area is varied. The largest village in the area is Waddesdon and there are individual farms and dwellings, along with further small settlements, distributed throughout the area.

1.2.2 The dominant transportation sound sources in this CFA include road traffic on the A41, Quainton Road, Station Road and Blackgrove Road. Trains are also audible close to the railway line running to the north and east of Waddesdon, and occasionally from the line that serves the Calvert Landfill site.

1.2.3 The A41 is a busy main road, running through the centre of Waddesdon. It carries a relatively large volume of traffic, including cars and heavy goods vehicles. At properties close to the A41, the sound of road traffic is dominant and gives rise to relatively high local sound levels with typical daytime values of up to approximately 75dB[1]. At locations in the village further from the A41, sound levels during the day are typically approximately 50dB, generally dropping by 7 to 10dB during the night[2] dependent upon location.

1.2.4 Quainton Road runs from the A41 in Waddesdon to Quainton further north. Properties in the north of Waddesdon, adjacent to this road, experience daytime

[1] Quoted dB values at residential areas refer to the free-field 16 hour daytime (07:00 to 23:00) equivalent continuous sound pressure level, $L_{pAeq,16hr}$.
[2] Night-time sound levels refer to the free-field 8 hour night-time (23:00 to 07:00) equivalent continuous sound pressure level, $L_{pAeq,8hr}$.

sound levels of around 60dB, typically dropping by 10dB during the night. Properties further from the A41 experience lower sound levels from traffic due to increased distance, and in some cases a degree of screening. The soundscape in these areas consists of intermittent local road traffic underpinned by the constant sound of more distant road traffic (from the A41). Intermittent aircraft over-flights and natural sounds are also present.

1.2.5 Dwellings along Blackgrove Road experience the constant sound of distant road traffic and intermittent local road traffic, along with the sounds of aircraft over flight and natural sounds. There are also a number of farmhouses in this area which typically experience the sound from distant road traffic at relatively low levels along with intermittent sounds from farm equipment. Daytime sound levels at these properties are typically around 50dB.

1.2.6 Properties along Station Road to the south of Quainton, typically experience daytime sound levels of around 50dB from vehicles on this road, along with natural sounds and railway traffic, including steam trains. Sounds from farming activities are also occasionally audible. Night-time sound levels in this area are typically 6 to 7dB lower than the daytime levels.

1.2.7 In the north of the study area there are a number of more remote properties. The sound environment in these areas includes vehicles using local roads, the sound of occasional aircraft over-flights, natural sources and agricultural activities. Sound levels at these properties vary from location to location, dependent on the proximity of local sources, but are typically between 45 and 55dB during the daytime. Night-time sound levels are typically around 8 to 10dB lower than the daytime levels..

2 Scope, assumptions and limitations

2.1 Sound and vibration sensitive receptors

2.1.1 Within the Waddesdon and Quainton area, 75 assessment locations have been defined to represent all identified sound and vibration sensitive receptors within the spatial scope. The assessment locations are shown on the Map Series SV-03 and SV-04 (Volume 5, Sound, Noise and Vibration Map Book). Within this area, the following types of sound and vibration sensitive receptors have been identified:

- residential areas;
- education facilities;
- community centres and meeting facilities;
- places of worship; and
- healthcare facilities.

2.2 Local engagement

2.2.1 Discussions have been held with representatives of Aylesbury Vale District Council regarding the approach which has been taken to baseline monitoring within this area, the identification of sound and vibration sensitive receptors, the selection of assessment location and baseline sound levels at these assessment locations.

2.2.2 Changes suggested during these meetings have influenced the assessment locations used and the monitoring undertaken and reported in this document.

2.2.3 Representatives of Aylesbury Vale District Council have also attended baseline sound measurements in this area and witnessed the measurement procedures used.

2.2.4 Local engagement through community forum meetings has also provided the opportunity for local groups to suggest appropriate baseline sound monitoring locations. Any suggestions received from these groups have been considered and have influenced the monitoring undertaken and reported in this document.

2.3 Existing baseline sound monitoring locations

2.3.1 In parts of this area, due to limited land access, baseline sound levels have been derived by means of extrapolation of measurements made at similar locations in the area.

2.3.2 Maps showing the baseline sound monitoring locations and assessment locations within this area are included in Map Series SV-03 and SV-04 (Volume 5, Sound, Noise and Vibration Map Book).

3 Environmental baseline

3.1 Existing baseline data collection methodology

3.1.1 The overall approach to baseline data collection for sound noise and vibration is described in Volume 5: Appendix SV-001-000.

3.1.2 Over the Waddesdon and Quainton area, a large number of baseline sound measurements have been undertaken. These have been classified as follows:

- long-term measurements – unattended measurements of several days duration;
- medium-term measurements – attended measurements of several hours duration (generally repeated at different times of day); and
- short-term measurements – attended measurements typically of 30 minutes duration (generally repeated at different times of day).

3.1.3 In this CFA a total of 24 baseline sound level measurements have been undertaken.

3.1.4 In Waddesdon, long-term measurements have been undertaken at five locations throughout the village. Short-term measurements have been undertaken at seven additional locations.

3.1.5 A further two long-term measurements have been completed at isolated properties to the east of Waddesdon.

3.1.6 To the south of Quainton at locations along Station Road and around the Buckingham Railway Centre, three long-term measurements and a short-term measurement have been undertaken. A further long term measurement has been completed at an isolated residential property to the west of Quainton.

3.1.7 Five long-term measurements were undertaken at isolated residential properties at various locations to the south of Finmere Wood. These locations were chosen to be representative of the scattered residential properties in the northern section of the Waddesdon and Quainton area.

3.2 Existing baseline sound levels

3.2.1 From the measurements described in Section 3.1, baseline sound levels have been ascertained for each assessment location within this area. These levels are presented in terms of the following key sound indicators:

- For the operational sound assessment
  - $L_{pAeq,16hr}$ weekday daytime (07:00-23:00) sound pressure level;
  - $L_{pAeq,8hr}$ weekday night-time (23:00-07:00) sound pressure level;
  - arithmetic average of $L_{pAFmax,5min}$ night-time sound pressure level; and

- highest $L_{pAFmax,5min}$ night-time sound pressure level.

- For the construction sound assessment
  - daytime L_{pAeq} sound pressure level (Monday to Friday 07:00-19:00; Saturday 07:00-13:00);
  - evening/weekend L_{pAeq} sound pressure level (Monday to Friday 19:00-23:00; Saturday 13:00- 23:00; Sunday 07:00 to 23:00); and
  - night-time L_{pAeq} sound pressure level (Monday to Sunday 23:00-07:00).

3.2.2 These values are presented in Table 1. The data source coding included within this table details how the baseline sound levels allocated to each assessment location have been derived. This coding is summarised in Table 2 and explained in detail in Volume 5: Appendix SV-001-000.

Table 1: Existing baseline sound levels

Assessment location ID	Area represented	Measurement location	Existing baseline sound level (dB)							Data source coding
			For operational sound assessment				For construction sound assessment			
			Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening/ weekend L_{pAeq}	Night-time L_{pAeq}	
286675	Edgcott, Aylesbury	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,iii,b
286717	Edgcott, Aylesbury	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,iii,b
289842	Unnamed Road, Quainton	CS3033	60.2	53.0	62.2	82.1	60.4	58.3	53.4	3,A,iii,b
290161	Taylor'S Corner, Waddesdon	CS0052	45.9	39.2	63.5	78.1	45.9	43.3	39.2	3,D,ii,b
290385	Doddershall, Quainton	CS4100	45.9	37.5	47.4	68.8	46.8	43.4	36.9	1,A,iii,b
290441	Doddershall, Quainton	CS4100	45.9	37.5	47.4	68.8	46.8	43.4	36.9	1,A,iii,b
290916	Bicester Road, Waddesdon	CS8058	54.8	47.4	54.5	63.6	55.1	52.8	47.8	1,A,iii,b
291296	Quainton Road, Quainton	CS3033	60.2	53.0	62.2	82.1	60.4	58.3	53.4	3,A,iii,b
291320	Quainton, Aylesbury	CS3033	60.2	53.0	62.2	82.1	60.4	58.3	53.4	3,A,iii,b
291382	Station Road, Quainton	CS2106	50.1	42.9	51.7	71.6	49.9	47.8	42.9	1,A,i,a
291492	Doddershall, Quainton	CS4100	45.9	37.5	47.4	68.8	46.8	43.4	36.9	1,A,iii,b
291511	Station Road, Quainton	CS3033	60.2	53.0	62.2	82.1	60.4	58.3	53.4	3,A,iii,b
291754	Goss Avenue, Waddesdon	CS3036	66.7	59.3	84.7	99.2	67.2	70.5	58.8	3,C,ii,b
291885	Sharps Close, Waddesdon	CS0035	50.8	45.1	50.7	79.9	51.8	51.3	43.5	1,A,ii,b
292062	Warmstone Close, Waddesdon	CS0035	50.8	45.1	50.7	79.9	51.8	51.3	43.5	1,A,ii,b

Assessment location ID	Area represented	Measurement location	Existing baseline sound level (dB)							Data source coding
			For operational sound assessment				For construction sound assessment			
			Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening/ weekend L_{pAeq}	Night-time L_{pAeq}	
292369	Sharps Close, Waddesdon	CS3036	66.2	58.8	84.7	99.2	66.7	70.0	58.3	3,C,ii,b
292489	High Street, Waddesdon	CS3036	78.8	71.4	84.7	99.2	79.3	82.6	70.9	3,A,ii,b
292667	High Street, Waddesdon	CS3035	71.1	64.1	75.8	90.3	72.1	75.4	63.7	3,A,ii,b
293404	Frederick Street, Waddesdon	CS3035	60.9	53.9	75.8	90.3	61.9	65.2	53.5	3,C,ii,b
293570	High Street, Waddesdon	CS5101	47.1	36.4	43.8	58.4	47.9	47.0	36.7	1,A,ii,b
293650	Little Britain, Waddesdon	CS0053	50.6	41.5	52.5	67.1	51.6	50.7	41.5	3,A,ii,b
293784	Anstey Close, Waddesdon	CS3037	50.0	43.4	52.0	66.5	50.4	53.7	44.9	1,A,ii,b
293796	Anstey Close, Waddesdon	CS3036	67.6	60.2	84.7	99.2	68.1	71.4	59.7	3,C,ii,b
293964	Baker Street, Waddesdon	CS3035	66.1	59.1	75.8	90.3	67.1	70.4	58.7	3,B,iii,b
294049	Quainton Road, Waddesdon	CS3037	50.0	43.4	52.0	66.5	50.4	53.7	44.9	1,A,iii,b
294165	Quainton Road, Waddesdon	CS0052	45.9	39.2	63.5	78.1	45.9	43.4	39.2	3,D,ii,b
294193	Quainton Road, Waddesdon	CS0052	59.8	49.1	63.5	78.1	60.5	59.6	49.3	3,A,i,a
294430	Frederick Street, Waddesdon	CS0051	47.9	39.2	63.4	78.1	49.1	48.2	39.2	3,C,ii,b
294499	Frederick Street, Waddesdon	CS5101	47.1	36.4	43.8	58.4	47.9	47.0	36.7	1,A,iii,b
294777	Quainton Road, Waddesdon	CS2063	42.7	33.3	39.7	58.2	43.3	43.1	33.8	1,A,ii,b
294910	New Street, Waddesdon	CS5101	47.1	36.4	43.8	58.4	47.9	47.0	36.7	1,A,i,a

Assessment location ID	Area represented	Measurement location	Existing baseline sound level (dB)							Data source coding
			For operational sound assessment				For construction sound assessment			
			Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening/ weekend L_{pAeq}	Night-time L_{pAeq}	
295086	Little Britain, Waddesdon	CS2062	47.1	45.4	49.3	67.1	47.7	45.6	45.4	1,A,i,a
295181	Anstey Close, Waddesdon	CS3037	50.0	43.4	52.0	66.5	50.4	53.7	44.9	1,A,ii,b
295222	Little Britain, Waddesdon	CS2062	47.1	45.4	49.3	67.1	47.7	45.6	45.4	1,A,ii,b
295618	Station Road, Quainton	CS1212	51.7	46.2	45.3	76.8	50.6	53.2	46.1	1,A,i,a
295689	Station Road, Quainton	CS1212	51.7	46.2	45.3	76.8	50.6	53.2	46.1	1,A,ii,b
295776	Station Road, Quainton	CS1212	51.7	46.2	45.3	76.8	50.6	53.2	46.1	1,A,ii,b
295872	Station Road, Quainton	CS1212	51.7	46.2	45.3	76.8	50.6	53.2	46.1	1,A,ii,b
296202	Unnamed Road, Quainton	CS1212	45.9	39.2	45.3	76.8	45.9	44.6	39.2	1,D,ii,b
296529	Quainton, Aylesbury	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,i,a
296784	Edgcott, Aylesbury	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,iii,b
296808	Edgcott, Aylesbury	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,iii,b
296850	Calvert Road, Middle Claydon	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,iii,b
296997	Doddershall, Quainton	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
297008	Quainton, Aylesbury	CS0037	53.4	41.6	44.8	77.5	54.2	50.6	41.4	1,A,ii,b
297063	Calvert Road, Middle Claydon	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,iii,b
297078	Doddershall, Quainton	CS4100	45.9	37.5	47.4	68.8	46.8	43.4	36.9	1,A,ii,b

Assessment location ID	Area represented	Measurement location	Existing baseline sound level (dB)							Data source coding
			For operational sound assessment				For construction sound assessment			
			Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening/ weekend L_{pAeq}	Night-time L_{pAeq}	
297144	Doddershall, Quainton	CS4100	45.9	37.5	47.4	68.8	46.8	43.4	36.9	1,A,ii,b
297166	Doddershall, Quainton	CS4100	45.9	37.5	47.4	68.8	46.8	43.4	36.9	1,A,i,a
297249	Quainton, Aylesbury	CS5125	48.7	39.1	45.4	73.0	49.5	49.1	39.9	1,A,i,a
297256	Quainton, Aylesbury	CS5125	48.7	39.1	45.4	73.0	49.5	49.1	39.9	1,A,ii,b
298562	Lawn Hill, Quainton	CS4000	44.9	38.6	45.1	64.5	45.8	42.4	36.9	1,A,ii,b
310373	Aylesbury Road, Waddesdon	CS8058	62.2	54.8	54.5	63.6	62.5	60.2	55.2	1,BC,iii,b
310408	Blackgrove Road, Waddesdon	CS1305	49.3	52.1	53.3	86.4	49.8	52.1	52.0	1,A,ii,b
310474	Blackgrove Road, Waddesdon	CS1305	49.3	52.1	53.3	86.4	49.8	52.1	52.0	1,A,i,a
310687	Waddesdon, Aylesbury	CS8058	54.8	47.4	54.5	63.6	55.1	52.8	47.8	1,A,ii,b
310700	Fleet Marston, Aylesbury	CS8058	54.8	47.4	54.5	63.6	55.1	52.8	47.8	1,A,i,a
310792	Waddesdon, Aylesbury	CS8058	54.8	47.4	54.5	63.6	55.1	52.8	47.8	1,A,ii,b
700346	Blackgrove Road, Waddesdon	CS1305	49.3	52.1	53.3	86.4	49.8	52.1	52.0	1,A,ii,b
700348	Aylesbury Road, Waddesdon	CS3037	50.0	43.4	52.0	66.5	50.4	53.7	44.9	1,A,iii,b
700349	Unnamed Road, Waddesdon	CS3037	50.0	43.4	52.0	66.5	50.4	53.7	44.9	1,A,iii,b
700350	Unnamed Road, Waddesdon	CS0052	59.8	49.1	63.5	78.1	60.5	59.6	49.3	3,A,ii,b
709515	High Street, Waddesdon	CS3035	71.1	64.1	75.8	90.3	72.1	75.4	63.7	3,A,ii,b

Assessment location ID	Area represented	Measurement location	Existing baseline sound level (dB)							Data source coding
			For operational sound assessment				For construction sound assessment			
			Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime L_{pAeq}	Evening/ weekend L_{pAeq}	Night-time L_{pAeq}	
709516	Baker Street, Waddesdon	CS3035	71.1	64.1	75.8	90.3	72.1	75.4	63.7	3,A,ii,b
709517	Baker Street, Waddesdon	CS0035	50.8	45.1	50.7	79.9	51.8	51.3	43.5	1,A,ii,b
901018	Unnamed Road, Quainton	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
901019	Unnamed Road, Quainton	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
901020	Unnamed Road, Middle Claydon	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
901021	Balmore Wood, Middle Claydon	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
901022	Unnamed Road, Middle Claydon	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
901023	Unnamed Road, Grendon Underwood	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
901024	Three Points Lane, Middle Claydon	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
901025	Three Points Lane, Middle Claydon	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b
901026	Calvert Road, Steeple Claydon	CS0056	54.9	46.3	50.7	75.7	55.5	53.3	45.4	1,A,ii,b
901027	Unnamed Road, Middle Claydon	CS0080	45.8	38.6	50.2	70.6	46.8	44.4	39.4	1,A,ii,b

Table 2: Data source coding key

Code	Data source type
1	Long-term measurement location
2	Short-term (linked to simultaneous long-term)
3	Short-term (using profile from non-simultaneous long-term)
4	Short-term using standard (National Noise Incidence Study[3] or other) 24hr profile
5	Specific validated prediction
6	Predictions from other sources (Department of Environment, Food and Rural Affairs (Defra) noise maps[4], etc.)
7	Generic levels

Code	Corrections applied
A	Data from above source applied directly
B	Correction applied for screening
C	Correction applied for distance from source
D	Minimum level cut-off applied

Code	Distance from measurement
i	Data applied from a measurement at or very close to the assessment location.
ii	Data applied from a local measurement location at a greater distance but noted to have equivalent acoustic climate.
iii	Data applied from a distant measurement location where sound levels would be expected to be similar.

Code	Uncertainty
a	Data are considered highly representative of the prevailing sound climate.
b	Data are considered representative of the prevailing sound climate, but variations in measured levels indicate that there may be a higher degree of uncertainty than for (a).
c	Data are considered to be an estimate of the sound climate, (e.g. taken from Defra noise maps, etc.).

[3] Building Research Establishment (2002), *National Noise Incidence Study*, 2000/2001.
[4] Defra; Noise Mapping England; http://services.defra.gov.uk/wps/portal/noise/; Accessed: 26 July 2013.

3.3 Future baseline methodology

Construction

3.3.1 The assessment of noise from construction activities assumes a baseline year of 2017. As a conservative assumption, it has been assumed that no change in baseline sound levels will occur between the existing baseline (2012/13) and the future baseline year of 2017.

3.3.2 Due to the duration of the construction work and as the precise timing of the highest sound levels would be different in each location, using baseline sound levels for 2017 as the start of the construction period, provides a reasonable worst case assessment.

3.3.3 The assessment of construction traffic is based on future baseline traffic flows for 2021, as a year representative of the middle of the construction period.

Operation

3.3.4 There is potential for future baseline sound levels for operation (2026) to change when compared to the existing baseline sound levels (2012) as a result of changes in baseline sound sources.

3.3.5 In the vast majority of cases where change might occur it is expected that baseline sound levels will increase at assessment locations due to increases in vehicle movements on roads. It is therefore considered that the use of the 2012 baseline levels in the operational assessment will result in a worst case assessment of the impact of changes in the future baseline sound levels in the majority of locations.

3.3.6 Therefore, for the purposes of this assessment future baseline levels have been assumed to be identical to those identified in Table 1 for 2012.

3.3.7 In addition, based on available road traffic information a screening exercise has been undertaken to identify any areas in which a reduction in baseline sound level might be likely. Where reductions in baseline sound level have been identified a further screening assessment has been completed to identify if these changes would be likely to materially affect the operational sound assessment.

3.3.8 The screening assessment has not identified any locations in this area where a decrease in future baseline (2026), compared to existing baseline (2012), is likely to materially affect the operational sound assessment.

4 References

Building Research Establishment (2002), *National Noise Incidence Study*, 2000/2001.

Defra; Noise Mapping England; http://services.defra.gov.uk/wps/portal/noise/; Accessed: 26 July 2013.